REMARKS

Claims 85-93 are pending in the present application. In the Office action dated August 5, 2005, claims 85 and 91-93 were rejected under 35 U.S.C. 103(a) as being unpatentable over Tolles et al. (U.S. Patent No. 5,738,574) in view of Wilson et al., (U.S. Patent No. 6,149,512) as set forth in the Office Action dated February 24, 2005. Claims 85 and 89 were rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson et al. (U.S. Patent No. 6,149,512) in view of Tolles et al. (U.S. Patent No. 5,738,574), as set forth in the Office Action dated February 24, 2005. Claim 90 was rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson et al. (U.S. Patent No. 6,149,512) in view of Tolles et al. (U.S. Patent No. 5,738,574) and further in view of Tietz (U.S. Patent No. 6,135,859), as set forth in the Office Action dated February 24, 2005.

The disclosed embodiments of the invention will now be discussed in comparison to the prior art. Of course, the discussion of the disclosed embodiments, and the discussion of the differences between the disclosed embodiments and the prior art subject matter, do not define the scope or interpretation of any of the claims. Instead, such discussed differences merely help the Examiner appreciate important claims distinctions discussed thereafter.

The various embodiments of the invention are directed to methods and apparatuses for conditioning and monitoring a planarizing medium used for planarizing a microelectronic substrate. In one embodiment, the apparatus includes a conditioning body coupled to a support member for supporting the conditioning body on the planarizing pad. The conditioning body includes a conditioning surface that is configured to engage a planarizing surface of the planarization medium. The conditioning body and the planarization medium are movable relative to the other when the planarizing medium is undergoing conditioning. The disclosed apparatus further includes a force sensor for detecting a frictional force imparted to the conditioning body by the planarizing medium when at least one of the conditioning body and the planarizing medium is moved relative to the other.

In operation, the conditioning body and the polishing pad are moved relative to each other and a frictional force is generated therebetween. As best shown in Figures 2-5, the frictional force is detected by it urging and displacing the conditioning body laterally (in direction H) across the polishing pad. The displacement of the conditioning body transmits a force to a force sensor that corresponds to the frictional force. For example, in one particular embodiment, a support coupled to the conditioning body may include two supports that are pivotable relative to one another, and the sensor may include a force sensor positioned between

the two members to detect a force applied by one support member on the other support member as the conditioning body is displaced. In another embodiment, the support member may include a piston that is movably received in a cylinder, and the sensor includes a pressure transducer that is configured to sense pressure changes in the cylinder as the piston is displaced with the displacement of the conditioning body.

The examiner has cited the Tolles patent. The Tolles patent discloses an apparatus for polishing semiconductor wafers. The apparatus includes a conditioner head 64. As the surface of the polishing pad 54 rotates under the conditioning head 64, the coefficient of friction between the polishing pad 54 and the conditioner head 64 varies due to the varied surface condition of the polishing pad 54. When the friction between the conditioner head 64 and the polishing pad 54 increases, the torque necessary to turn the conditioner head 64 at a constant velocity increases. This increase in torque causes the tension in the conditioner drive belt 1624 to increase tending to raise the conditioner head 64 off of the polishing pad 54 to thereby reduce the pressure and thus the abrasion of the conditioner head 64 on the polishing pad 54. Thus, the apparatus disclosed in the Tolles patent allows the downward force between the conditioner head 64 and the polishing pad 52 to automatically adjust so that the conditioner head 64 does not over or under condition a particular region of the polishing pad 52.

To the extent that the apparatus of the Tolles patent purportedly transmits a frictional force to a force sensor, it does not transmit a force to a force sensor indicative of the frictional force by the frictional force urging the conditioner head 64 laterally across the polishing pad 52. Assuming that the drive moving the conditioner head 64 acts as a force sensor, the force indicative of the frictional force generated between the conditioner head 64 and the polishing pad 52 is not transmitted by the frictional force urging the conditioner head 64 laterally across the polishing pad 52. The frictional force would be transmitted to the drive by an increase or a decrease in torque. Additionally, to the extent that the automatic raising and lowering of the conditioner head 64 can fairly be considered moving the conditioner head 64 laterally across the polishing pad 54, the movement is urged or effected by the tension in the conditioner drive belt 1624 and not the frictional force between the conditioner head 64 and the polishing pad 54. In contrast, in Applicant's embodiment, a force indicative of the frictional force generated between the conditioning body and the planarizing medium is transmitted to a force sensor by the frictional force urging the conditioning body laterally across the planarizing medium. The examiner has also cited the Wilson, Inaba, and Tietz patents, which do not remedy the above deficiencies of the Tolles patent.

Turning now to the claims, the patentably distinct differences between the cited references and the claim language will be specifically pointed out. Claim 85 recites, in part, "[a] A method for controlling conditioning of a continuous planarizing medium used for planarizing a microelectronic substrate, the method comprising: positioning the continuous planarizing pad around a pair of spaced apart rollers to define a first planarization station and an opposing second planarization station; engaging a conditioning body with the continuous planarizing pad proximate to at least one of the first planarization station and the opposing second planarization station and moving at least one of the conditioning body and the continuous planarizing medium relative to the other while the conditioning body contacts the continuous planarizing medium *to generate a frictional force between the conditioning body and the continuous planarizing medium; transmitting a force to a force sensor indicative of the frictional force by the frictional force urging the conditioning body laterally across the continuous planarizing medium*; and controlling at least one of a force between the conditioning body and the continuous planarizing medium and a speed of the conditioning body relative to the continuous planarizing medium in response to detecting the frictional force between the conditioning body and the planarizing medium." (Emphasis Added). As discussed above the Tolles patent does not teach or fairly suggest the emphasized limitations. The frictional force generated between the conditioning body and the planarizing medium is not transmitted to a force sensor in the manner recited in claim 85. The other cited references do not remedy the deficiencies of the Tolles patent.

Claims depending from claim 85 are also allowable due to depending from an allowable base claim and further in view of the additional limitations recited in the dependent claims.

All of the claims remaining in the application are now clearly allowable. Favorable consideration and a Notice of Allowance are earnestly solicited.

Respectfully submitted,

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